



THE SOCIAL LIFE OF A DATA BASE

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NOTE TO REVIEWERS:

ALL THE PRACA MATERIAL COMES FROM THE LARGER PRACA STUDY, WHICH HAS APPEARED BOTH AS A REPORT AND NASA/TM-2002-211846. BOTH HAVE ALREADY BEEN CLEARED FOR EXPORT CONTROL, AND ARE PUBLICALLY AVAILABLE.

Social Construction of Mechanisms of Memory



- It is well known that memory is socially constructed
- Studies have examined various mechanisms of social memory:
 - Archives (Trouillot)
 - Memorial Statuary (Nora)
 - Historical Theme Parks (Samuel)
 - Museums (White)
 - Holiday Observances (Connerton, Yerushalmi)
 - Institutional Narrative (Linde)

Data Bases: The Invisible Memory Mechanism



- Social science has paid little or no attention to data bases as socially constructed forms of memory
- Computer data bases are thought of as technological objects
- One might think it possible to study the social aspect of data bases by studying the processes of their construction
- However, databases are embedded within complex work systems
 - Many **layers** of human work required to produce and maintain their function
- These work practices are invisible to their designers and users

The Human in the Machine



- This paper shows some of the complex social life of a large data base:
 - Construction of data entries,
 - Human escorting of data within and across organizational boundaries,
 - Ongoing movement between paper and electronic data recording
 - Social practices which compensate for design deficiencies, but also mask their existence.

Data of the Study: A Large-Scale Problem Reporting Data Base



- This talk reports on a study of a NASA data base for reporting problems discovered in the inspection and refitting process for the Space Shuttle
 - PRACA (Problem Reporting And Corrective Action)
- PRACA is a complex system, distributed among several NASA centers and contracting organizations.
 - This complexity is not unique to NASA: many public and private institutions maintain enormous data bases, incorporating legacy systems which are resistant to change because their structure is no longer apparent.

The PRACA Study

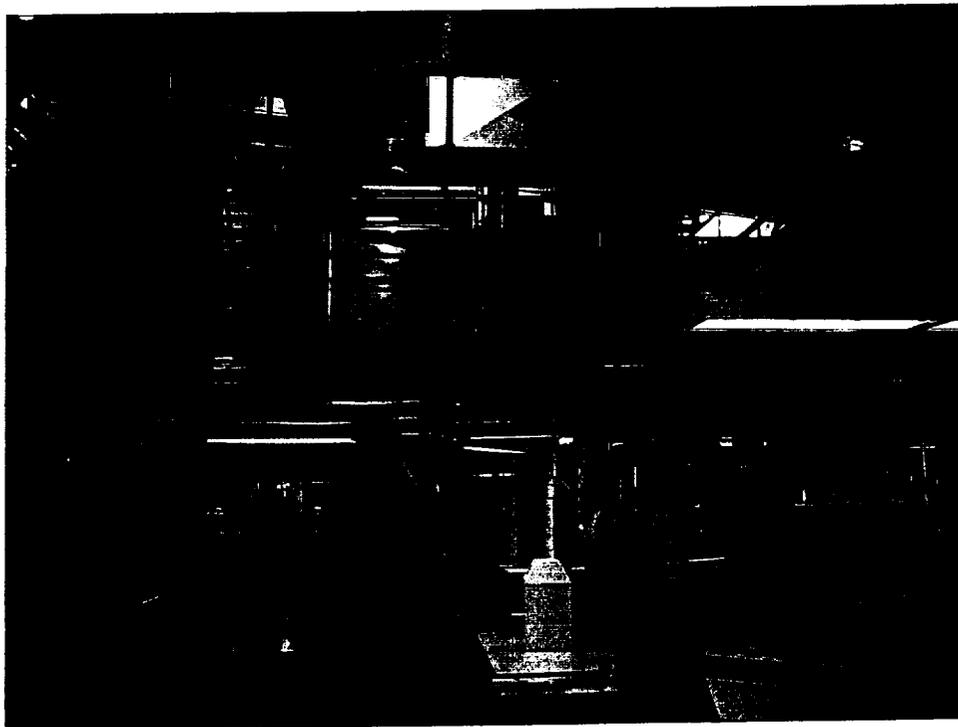


- Purpose: evaluate and quantify the technical aspects of PRACA systems and recommend enhancements future system upgrades.
- The study of the work system of PRACA reported on in this talk was part of a larger study mapping the locations, technologies, languages, and institutional responsibilities for PRACA
- Method for: preliminary study of work practices
 - Interviews with data base users and managers
 - Two sites
 - Kennedy Space Center – shuttle refitting
 - Johnson Space Center – go/no go decision on shuttle flight
 - Large study would involve ethnographic observation



Description of PRACA

- P 21, PRACA report, diagram, p 22



Multiple Uses of PRACA

- **Work Process Scheduling**
- **Flight Readiness Decision-making**
- **Statistical Analysis of Part and Process Failures**
- **Data for Mandated Investigations**

The Work of PRACA

- Initial Problem Entry
- Checking the form and the work
- Passing the report from KSC to JSC
- Getting report to Deputy Manager for Operations, Space Shuttle Vehicle Engineering Office (Go/No go decision maker)
- Tracking required repairs
- Using PRACA retrospectively

Multiple Forms of Invisibility



- Each of the above uses is invisible to users of all other types
- Paper instantiations of PRACA are invisible to computer designers and users
- Work of making PRACA work is invisible to high-level users

Such Systems are Everywhere



- This is an outmoded system
 - Opaque to users
 - Possesses emergent properties not intended by or known to original designers
 - No single owner of the design or implementation
- Such a system is more the rule than the exception
 - Legacy data bases are everywhere
 - Legacy data bases imply the existence of complex work practice systems, not just outmoded machines or languages



Two Morals to the Story

- Data Base Designers and Users
 - Be aware that data entry, interpretation and use are pervasively social activities, part of an integrated work system
- Anthropologists
 - Begin the analysis of these complex memory technologies as a locus for social activity as well as social construction